



“E-NEWS”
KENT COUNTY WATER AUTHORITY
NEWS LETTER

OCTOBER 2013

We sincerely thank all of our customers for their support, patience and understanding throughout the boil water advisory. We understand it was difficult and trying to our customers and we do apologize for the added inconvenience this may have caused in your daily routine.

Boil Water Advisory

As we are all regrettably aware, the Kent County Water Authority was under a Boil Water Advisory commencing September 22, 2013. This advisory was issued due to a single water quality sample taken from inside of a storage tank testing positive for E. Coli. All other system testing including homes in close proximity to the tank were negative for both Total Coliform and E. Coli. After the initial public notification the events leading to and throughout this Boil Water Advisory became a wash in a sea of innuendo in the media information. Please be assured the Kent County Water Authority acted in a responsible and expedient manner in conjunction with the regulatory mandates we must consistently comply with as a licensed public water system.

We feel it is important to provide our customers with the candid facts of this event along with pertinent regulatory requirements that provide a true understanding of the situation as it relates to the best interest of the public served.

The USEPA Total Coliform rule formalizes water sampling procedures aimed at assessing water quality at representative points in a public water system. The Total Coliform Rule (TCR), a National Primary Drinking Water Regulation (NPDWR), was published in 1989 and became effective in 1990. The rule set both a health goal (Maximum Contaminant Level Goal, or MCLG) and legal limits (Maximum Contaminant Levels, or MCLs) for the presence of total coliforms in drinking water. EPA set the MCLG for total coliforms at zero because there have been waterborne disease outbreaks in which researchers found very low levels of coliforms, so any level indicates some health risk. The MCL levels are based on the positive sample tests for total coliforms (monthly MCL), or for total coliforms and Escherichia coli (E. coli) or fecal coliforms (acute MCL).

The purpose of the 1989 TCR is to protect public health by ensuring the integrity of the drinking water distribution system and monitoring for the presence of microbial contamination. The rule requires all public water systems

(PWSs) to monitor for the presence of total coliforms in the distribution system at a frequency proportional to the number of people served. Systems which serve fewer than 1,000 people may test once a month or less frequently, while systems with 50,000 customers test at least 60 times per month and those with 2.5 million customers test at least 420 times per month. Water systems often take more than the required number of samples as a precaution, as Kent County Water Authority does.

To comply with the monthly MCL for total coliforms, PWSs must not find coliforms in more than five percent of the samples they take each month to meet EPA’s standards. If more than five percent of the samples contain coliforms, PWS operators must report this violation to the state and the public. If a sample tests positive for total coliforms, the system must collect a set of repeat samples located within 5 or fewer sampling sites adjacent to the location of the routine positive sample within 24 hours. When a routine or repeat sample tests positive for total coliforms, it must also be analyzed for fecal coliforms or E. coli, which are types of coliform bacteria that are directly associated with human contact. A positive result for fecal coliforms or E. coli can signify an acute MCL violation, which necessitates rapid state and public notification because it represents a direct health risk. Often, an acute violation due to the presence of fecal coliform or E. coli will result in a “boil water” notice. The system must also take at least 5 routine samples the next month of operation if any sample tests positive for total coliforms. To read the full requirements of the TCR, please see the Federal Register Notice of the rule from the link below. For more information about coliforms and their health effects, please the [TCR Basic Information page](#).

The most basic test for bacterial contamination of a water supply is the test for **total coliform bacteria**. Total coliform counts give a general indication of the sanitary condition of a water supply.

- A. **Total coliforms** include bacteria that are found in the soil, in water that has been influenced by surface water, and in human or animal waste.
- B. **Fecal coliforms** are the group of the total coliforms that are considered to be present specifically in the gut and feces of warm-blooded animals. Because the origins of fecal coliforms are more specific than the origins of the more general total coliform group of bacteria, fecal coliforms are considered a more

accurate indication of animal or human waste than the total coliforms.

- C. **Escherichia coli (E. coli)** is the major species in the fecal coliform group. Of the five general groups of bacteria that comprise the total coliforms, only E. coli is generally not found growing and reproducing in the environment. Consequently, E. coli is considered to be the species of coliform bacteria that is the best indicator of fecal pollution and the possible presence of pathogens.

Are Coliform Bacteria Harmful?

Most coliform bacteria do not cause disease. However, some rare strains of E. coli, particularly the strain 0157:H7, can cause serious illness. Recent outbreaks of disease caused by E. coli 0157:H7 have generated much public concern about this organism. E. coli 0157:H7 has been found in cattle, chickens, pigs, and sheep. Most of the reported human cases have been due to eating under cooked hamburger. Cases of E. coli 0157:H7 caused by contaminated drinking water supplies are rare.

So what did happen:

September 17, 2013

Water quality samples were collected from active water storage tanks. Kent County Water Authority enacted this proactive initiative years ago as an additional water quality safeguard for the system. Routine tank samples are not mandated by the rule and in RIDOH water quality regulatory requirements and if we hadn't been taking these samples the E.Coli event would not have been identified.

September 18, 2013

Wednesday Sept 18, the sample laboratory results from the Sept 17 Wakefield tank was total Coliform present. (**E. Coli could not be determined at that time**). Any Coliform positive sample result requires further analysis of the culture medium to determine if E.Coli is present and or to confirm E.Coli negative. This process requires up to an additional 48 hours of testing beyond the original 24 hours testing that determined the Total Coliform positive result. The sample from the tank went into the additional confirmation test (48 hours) process.

September 20/21, 2013

Friday Sept 20, the sample results from the Sept 17 Wakefield tank was confirmed E Coli Negative and only Total Coliform present. This information was presented to the RI Department of Health for further advisement. The confirmation testing presenting the E Coli negative, Total Coliform positive results triggers an additional round of repeat sampling per RIDOH regulatory requirements.

Friday Sept 20, 2013

A repeat sample was taken from the Wakefield Street Tank in addition to 2 downstream samples from customer homes per methods discussed and approved by Rhode Island Department of Health representative. There could be no upstream sample taken due to the dead end configuration of the main at the tank connection. The same dead end cal-de-sac main fills and draws from the tank.

Saturday, Sept 21, 2013

The laboratory result from the 24 hour test of the repeat samples taken Friday September 20 were received indicting the tank still **positive** for Total Coliform but the 2 downstream samples from the homes indicated **absent** of Total Coliform. This finding gave the strong indication that the tank may be experiencing some type of water quality issue. The repeat sample from the tank went into the additional 48 hours confirmation test process per RI Department of Health regulatory requirements. This information was presented to the RI department of Health for further advisement.

Sunday, September 22, 2013

At or about 9:30 a.m., Sunday, September 22, 2013, KCWA representatives received verbal notification from the laboratory that the result from the analysis of the Total Coliform medium culture that commenced Sept 20 was found to be E.Coli positive.

In accordance with the Total Coliform Rule (EPA – RIDOH Regulation) this triggers an Acute TCR Violation that requires the following:

- The violation must be reported to the state no later than the end of the next business day after the system learns of the violation.
- The public must be notified within 24 hours after the system learns of the violation using the method outlined in the RIDOH Regulations.

KCWA took steps to present this information in an expedient manner to the RI Department of Health in an attempt to bring together coordinated guidance that assured the notice was substantively regulatory compliant and pertinent to the situation as it relates to the affected portions of the service area.

KCWA duty personnel immediately notified the General Manager Chief Engineer of the positive E.Coli result. The Wakefield Street tank was ordered to be mechanically isolated from the remainder of the public water system in conjunction

with obtaining a full round of system test samples for analysis.

RIDOH officials, Warwick Water superintendent, KCWA Board members and critical customers such as Kent County Hospital were notified of the positive E.Coli result. KCWA staffs were being recalled to assist. The draft Boil Water Advisory was simultaneously being modifying to include the Potowomut section of Warwick at the request of RIDOH representatives.

RIDOH official explained KCWA now had an acute violation of the Total Coliform Rule and he would notify the head of RIDOH Drinking Water Quality June Swallow, for regarding any additional action she wanted taken by RIDOH public relations department.

KCWA staff began to assemble to gear up for customer service response. This recall established the increased manning level 24 hour phone "center" operations that continued through and including the early morning hours of September 26, 2013.

Approximately 1:50 p.m. RIDOH Chief of Drinking Water Quality requests a copy of the proposed Boil Water Advisory and preparation of a map outlining the affected area emailed to her home for review. Approximately 2:44 p.m. the map was completed and both the notice and map were sent for review.

Approximately 4:05 p.m. received verbal authorization from RIDOH, Chief of Drinking Water Quality and immediately commenced faxing notices out to all media outlets

After the boil water advisory was lifted the Kent County Water Authority conducted a comprehensive level 2 sanitary survey assessment of the entire system. The type of assessment is used by the water utility and RI Department of Health to help identify any possible cause for the positive sample results. No blatant sanitary deficiencies were identified during the survey. The survey did however bring to light some anomalies in the levels of disinfection residual at our wholesale purchase connections and hydraulic flow that may have been contributing factors leading to this event.

In the final analysis of this event only a single sample taken from inside a storage tank was the basis for the precautionary boil water advisory. With the exception of the one E.coli positive tank sample all other routine samples taken throughout the system during and after the boil water advisory were absent of any contamination. Ironically, samples taken from inside this tank after the boil water order was lifted showed no signs of either Total Coliform or E.coli contamination.

The tank in question continues to be mechanically isolated from the rest of the distribution because of hydraulic issues that could lead to excessive water residence time and the possibility of stagnation of the storage volume. A hydraulic study is underway to fully evaluate the further need for this storage volume in this sector of the system and the tank will be permanently eliminated from use if the study reveals it has reached its usefulness.

A number of valuable lessons learned were recognized during this event. Since this incident we have been working closely with RI Department of Health RI Emergency Management Agency and Division of Public Utilities and Carriers officials to coordinate a public notification and response process on a statewide level that can be considered a prototype response standard for all other water utilities. At the direction of the Governor through the RI Emergency Management Agency (RIEMA) envisioned a one call center for information and notice distribution that is now actively being considered using RIEMA as the incident coordinator. Kent County Water Authority concurs with the RIEMA central coordinator concept for statewide water utility implementation of the notification and update process in matters of public health.